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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/797,468	03/10/2004	Martin Simon	P2001,0649	3312

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EXAMINER

KIM, KEVIN

ART UNIT	PAPER NUMBER
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2611

MAIL DATE	DELIVERY MODE
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10/16/2007

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/797,468

Applicant(s)

SIMON, MARTIN

Examiner

Kevin Y. Kim

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 05 October 2007.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-22 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-22 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- ☐ Notice of References Cited (PTO-892)
- ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- ☒ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____
- ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- ☐ Notice of Informal Patent Application
- ☐ Other: _____

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on October 5, 2007 has been entered.

Response to Arguments

2. Applicant's arguments filed October 5, 2007 have been fully considered but they are not persuasive.

Applicant traverse the rejection of the claims by arguing that the teaching of the Franchiville et al patent as the undersampling can not be combined with the Walczak et al's pre-emphasis network because the Franchiville et al patent fails to teach undersampling of the modulated transmission signal. The Franchiville et al patent was relied upon to establish the benefits and thus obviousness of undersampling of a signal. Since the modulated transmission signal is already disclosed by Walczak et al, the question is whether the undersampling of the Walczak et al's modulated transmission signal (the output from element 410) would have been obvious. Applicant asserts that the specification discloses that the undersampling ensures sideband suppression and carrier suppression. First of all, this effect is not recited in the claims. Second, the fact that applicant has recognized another advantage which would flow naturally from following the suggestion of the prior art cannot be the basis for patentability when the

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differences would otherwise be obvious. See *Ex parte Obiaya*, 227 USPQ 58, 60 (Bd. Pat. App. & Inter. 1985).

Claim Rejections - 35 USC § 103

4. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

5. Claims 1-5,14-17 and 22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Walczak et al (US 5,193,223) in view of Franchville et al (US 6,041,076) and Ichihara (US 6,587,513).

Claim 1.

Walczak et al discloses a signal transmission apparatus (see Fig.5), comprising:

a quadrature modulator (402) having an in-phase and quadrature input for receiving a complex-value payload signal (I and Q), having a local oscillator (406) signal input for receiving a local oscillator signal at a carrier frequency (90 MHz), and having a signal output for providing a modulated transmission signal,

a digital signal processing unit (502 in Fig.5 and 601 in Fig.7) coupled to the in-phase and quadrature input for receiving the complex-value payload signal (I and Q) and includes a pre-emphasis network (not illustrated) which is adapted to effect the amplitude of the in-phase and quadrature input (see col. 7, lines 35-46); and

a feedback path which couples the signal output to the digital signal processing unit, the feedback path including an analog/digital converter (118) for sampling the modulated transmission signal to produce an envelope of the modulated transmission

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signal, wherein the preemphasis network setting is a function of the envelope of the modulated transmission signal (see col.8, lines 5-23).

The claimed invention first differs from Walczak et al's apparatus in that it requires "undersampling" the modulated transmission signal with respect to the carrier frequency. Franchville et al teaches that undersampling having a sampling rate below the required Nyquist rate reduces processing speed requirements including that of the A/D converter. See Summary of the Invention at cols.3 and 4. Thus, it would have been obvious to one skilled in the art at the time the invention was made to undersample the modulated transmission signal in producing an envelope of the modulated transmission signal in Walczak et al's apparatus for the purpose of reducing processing speed requirements including that of the A/D converter as taught by Franchville et al.

The claimed invention additionally requires a preemphasis network in the digital processing unit to set the phase angle and/or amplitude of the in-phase and quadrature input. Ichihara teaches a predistortion network to set the amplitude of the I and Q signals that are to be provided to the quadrature modulator in order to compensating a distortion. Thus, it would have been obvious to one skilled in the art at the time the invention was made to provide a predistortion network in the digital processing unit of Walczak et al for the purpose of reducing distortion as taught by Ichihara.

Claim 2.

Walczak et al discloses that the quadrature modulator includes first and second Gilbert multipliers (404,408) which respectively receive in-phase and quadrature components of

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the complex-value payload signal, and the quadrature modulator including an adder (410), the first and second Gilbert multipliers having respective outputs which are coupled to the adder.

Claim 3.

Walczak et al discloses a bandpass filter (109) connected between the signal output and the feedback path.

Claims 4 and 5.

Walczak et al discloses a low pass filter (524) upstream of the ADC. See col. 8, lines 1-4 describing a finite impulse baseband filter.

Claim 14.

Since the digital controller (502) receives a digital signal from the A/C converter, the digital signal is stored in a register and used by the digital controller.

Claim 15.

Walczak et al discloses that the quadrature modulator includes first and second Gilbert multipliers (404,408) which respectively receive in-phase and quadrature components of the complex-value payload signal, and the quadrature modulator including an adder (410), the first and second Gilbert multipliers having respective outputs which are coupled to the adder.

Claim 16.

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Walczak et al discloses a bandpass filter (109) connected between the signal output and the feedback path.

Claim 17.

Walczak et al discloses a low pass filter (524) upstream of the ADC. See col. 8, lines 1-4 describing a finite impulse baseband filter.

Claim 22.

Walczak et al discloses a TDMA cellular telephone (see Abstract), which is a mobile radio signal transmission apparatus.

6. Claims 6,7,10 and 13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Walczak et al in view of Franchville et al and Ichihara as applied to claim 1 above, and further in view of Shyue (US 6,359,936).

Claim 6.

Walczak et al in combination with Franchville et al further discloses that the apparatus includes first and second digital/analog converters (504,512) coupled between the digital signal processing unit and the in-phase and quadrature input, the first and second digital/analog converters for respectively supplying in-phase and quadrature components of the complex-value payload signal but fails to show first and second low-pass filters respectively coupling the first and second digital/analog converters to the in-phase and quadrature input.

Shyue describes its own prior art quadrature modulator (see Fig.1) where low pass filters (5A, 5B) are respectively coupled to the DACs (4A,5A) apparently to remove undesired out of band signals. Thus, it would have been obvious to one skilled in the art at the time the invention

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was made to couple first and second low-pass filters respectively between the first and second digital/analog converters (504,512) to the in-phase and quadrature input of the modulator (402), as shown in Shyue, in order to remove undesired out of band signals.

Claim 7.

Walczak et al discloses that the quadrature modulator includes first and second Gilbert multipliers (404,408) which respectively receive in-phase and quadrature components of the complex-value payload signal, and the quadrature modulator including an adder (410), the first and second Gilbert multipliers having respective outputs which are coupled to the adder.

Claims 10,13.

Since the digital controller (502) receives a digital signal from the A/C converter, the digital signal is stored in a register and used by the digital controller.

7. Claims 8,9,11,12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Walczak et al, Franchville et al, Ichihara and Shyue as applied to claims 6, 7 above, and further in view of Torre et al (US 6,720,839).

Claims 8 and 11.

Walczak et al, Franchville et al and Shyue in combination further discloses that the amplitude is adjusted as a function of the envelope of the modulated transmission signal. See col. 7, lines 10-34. The claimed invention additionally requires influencing the phase angle of the complex-value payload signal as a function of the envelope of the modulated transmission signal.

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Torre et al teaches adjusting the phase relation of the base band signal to the quadrature modulator based on the feedback modulated signal. See 2A and col.2, line 60- col.3, line 8 in particular. Thus, it would have been obvious to correct the phase as well as the amplitude of the I and Q signal input to the quadrature modulator as taught by Torre et al.

Claims 9 and 12.

Since the digital controller (502) receives a digital signal from the A/C converter, the digital signal is stored in a register and used by the digital controller.

8. Claims 18-21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Walczak et al in view of Franchville et al and Ichihara as applied to claim 1 above, and further in view of Torre et al (US 6,720,839).

Claim 18.

Walczak et al in combination with Franchville et al further discloses that the amplitude is adjusted as a function of the envelope of the modulated transmission signal. See col. 7, lines 10-34. The claimed invention additionally requires influencing the phase angle of the complex-value payload signal as a function of the envelope of the modulated transmission signal.

Torre et al teaches adjusting the phase relation of the base band signal to the quadrature modulator based on the feedback modulated signal. See 2A and col.2, line 60- col.3, line 8 in particular. Thus, it would have been obvious to correct the phase as well as the amplitude of the I and Q signal input to the quadrature modulator as taught by Torre et al.

Claim 19.

Walczak et al discloses that the quadrature modulator includes first and second Gilbert multipliers (404,408) which respectively receive in-phase and quadrature components of the

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complex-value payload signal, and the quadrature modulator including an adder (410), the first and second Gilbert multipliers having respective outputs which are coupled to the adder.

Claim 20.

Walczak et al discloses a bandpass filter (109) connected between the signal output and the feedback path.

Claim 21.

Walczak et al discloses a low pass filter (524) upstream of the ADC. See col. 8, lines 1-4 describing a finite impulse baseband filter.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kevin Y. Kim whose telephone number is 571-272-3039. The examiner can normally be reached on 8AM --5PM M-F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Shuwang Liu can be reached on 571-272-3036. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

October 15, 2007

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KEVIN KIM
PRIMARY PATENT EXAMINER

Handwritten signature of Kevin Kim in cursive script.